# OpenLearn and knowledge maps for language learning

## Book Section

# OpenLearn and knowledge maps for language learning

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**Abstract**

This chapter presents new methodologies designed to facilitate language acquisition in open learning communities via open educational resources and knowledge mapping. It specifically focuses on the OpenLearn project developed by the Open University. This offers a virtual learning environment based on Moodle platform with free educational materials and knowledge media tools such as the instant messaging MSG, the video webconference FlashMeeting and the knowledge mapping software tool Compendium. In this work, these technologies and mapping techniques are introduced in order to promote open language learning. Ways in which teachers and students can make use of these OpenLearn tools and resources are discussed and some benefits fully described.

## 1- Introduction - The open learning movement and language learning

Due to the rapid development of open source software and open content initiative, new strategies to improve techniques for teaching and learning languages are essential. Innovative tools and open educational resources for open learning provide wide opportunities to communicate and construct knowledge collaboratively (Willinsky, 2006; Cedergren, 2003). These new resources and new methodologies can bring new ways to foster meaningful learning.

The Open Content Initiative is a growing movement in the promotion of open learning which involves institutions, universities, researchers, teachers and scientists in the free access to world knowledge resources (O'Mahony and Ferraro, 2003). Its aim is to provide free access to quality teaching materials from the public domain from which open educational resources can be customized, improved and shared with local communities. These can be personalized to match local contexts and cultural aspects such as language, level of study, pre-requirements, learning outcomes, etc. (Downes 2006, Dholakia, King and Baraniuk, 2006; Jarman, 2006).

Open learning communities are defined as a set of people with common interests who interact collaboratively in order to learn together. There are five important features in an open learning community, these are: open products, integrity, transparency, non-discrimination and non-interference. (Reagle, 2004; 2006). Open communities are open to receive new members, share information, reconstruct knowledge and learn together developing *open products*. Participants ensure the *integrity* of the process and their contributions. They are *transparent* in self-organizing, making their own rules and defining their process. They do *not discriminate* between people, individuals or groups. Members can interact and work under their own understanding or conceptualization *without interference*. They are active contributors (Aigrain 2004, Stadler and Hirsh, 2002).

Open learning environments can be considered a new methodology for informal learning. Academics, teachers and students alike can benefit from the Open Educational Resource

Movement. Teachers can select high quality materials, use free tools and resources, and engage their students in open learning communities in order to develop skills such as:

- selecting extra and relevant learning materials;
- managing their own learning;
- contacting new fellow students;
- developing learning communities.

More specifically in language learning, open communities can be very useful in promoting meaningful learning. Students can become active learners by:

- communicating with people from different countries;
- practicing the language in real situations;
- sharing their personal context and creating meaningful opportunities for learning;
- using technology collaboratively to improve their understanding together.

Knowledge mapping can be an efficient strategy for educators, learners, professionals and researchers to deal with a large quantity of information on the web, select what is relevant and make connections structuring knowledge in a meaningful way. (Okada, and Buckingham Shum, 2006, Okada, 2007). Learning requires the ability to organize relevant information, connect it with previous knowledge, engage in critical thinking, and construct arguments. Students struggle with many of these skills. Knowledge Cartography can greatly facilitate these processes of learning, research and knowledge management. Well-designed maps are effective resources for building knowledge. They act as a concentrated database, and are powerful graphic tools for classifying, representing and communicating the connections between all kinds of information. Through knowledge mapping, learners can:

- exploit the mind's ability to establish relationships between thoughts and ideas;
- build graphical schemes that enable understanding through spatial relations;
- link arguments and relevant information together in flexible structures;
- represent opinions, alternative perspectives, different contexts;
- reduce search time and reveal connections that might otherwise not be noticed. (Okada, Buckingham Shum and Sherborne, 2008)

In this chapter, some examples from the OpenLearn – an open educational environment – are analyzed in order to illustrate knowledge mapping techniques and open educational resources as applied to language learning. OpenLearn was developed by the Open University in Moodle – a course management system. This Project was launched at the end of 2006, and open language learning communities are still developing. Thus, data at this moment are not enough for a case study. However, the intention of this work is to present possibilities and introduce new strategies that can be useful to foster language-learning communities.

## 2. The OpenLearn Project and Open Language Learning Resources

Project "OpenLearn" (http://openlearn.open.ac.uk), sponsored by the William and Flora Hewlett Foundation, provides free online learning material taken from Open University courses. It also offers free knowledge media technologies on a large-scale, connecting

learners with learners and learners with educators. OpenLearn also aims to help teachers reconstruct their own materials from existing open educational resources, downloading, editing, remixing and publishing new courses. The intention of OpenLearn is to enable a basis for world-wide collaborations over the development and dissemination of supported open learning in several fields including language learning.

The OpenLearn based on the open source Moodle platform consists of two virtual learning environments:

- LearningSpace (http://openlearn.open.ac.uk/) hosts a list of open educational resources. It is an area to access free educational resources organized in units and areas of knowledge. These units are initially in English, and based on the Open University's courses.
- LabSpace (http://labspace.open.ac.uk/) is the laboratory area to download LearningSpace materials to remix and reuse.
- Both areas integrate new technologies developed by the Knowledge Media Institute – KMi to foster learning communities.

Through OpenLearn, students interested in learning a foreign language can access materials in their own time and find peers from different countries all over the World. It is an opportunity for informal and collaborative study in areas of common interests. Participants can learn at their own pace, alone or in communities. They can manage their own progress by keeping a learning journal, by discussing the topics with other online learners in forums and by completing self-assessment exercises. In this way, participants can study high quality materials free, develop their online communities and manage their own language learning process (OpenLearn, 2007).

The target audience of OpenLearn comprises governmental and non-governmental entities interested in promoting continuing professional development to public and private higher education institutes interested in Open Educational Resources (OER) partnerships; academic teachers, tutors, training course designers, graduate and post-graduate students; educational researchers; professionals interested in specialization courses and anyone interested in learning.

In October 2006 OpenLearn published 900 learning hours in the LearningSpace and currently its goal is to make a further 8100 hours of material available within the LabSpace by the end of 2008. The Open Educational Resources, published mostly in English, are grouped into different categories: the Arts and History, Business and Management, Education, Health and Lifestyle, IT and Computing. In the Modern Languages category, there are several language courses including English, French, German, and Spanish.

The OpenLearn courses denominated "units" are self-contained and offer a mix of multimedia and web-based materials. These open educational resources include texts, activities, quizzes, forum, videos, presentations in webconferences and knowledge maps. They are designated at a particular academic level and take from 3 to 15 hours study time. The initial materials published were constructed from current OU courses plus other web based materials. However, OpenLearn expects to increase its OER through collaboration with interested participants willing to contribute to the open learning movement.

OpenLearn integrates three free knowledge media technologies in Moodle: the instant messaging MSG, the video webconference FlashMeeting and the knowledge mapping software tool Compendium. These free knowledge media tecnologies are accessible to everyone in LabSpace and LearningSpace.

### 3. Compendium: a language learning mapping tool

Compendium (http://www.compendiuminstitute.org) is a knowledge mapping software tool, which was initially developed by Verizon in 1993 and then by the Knowledge Media Institute

at the Open University in the UK. Through Compendium, language learners can represent their thoughts, ideas and information. They can select and connect interesting resources and structure their knowledge of the content. Diverse mapping techniques can help learners to model problems, connect concepts and map arguments in discussions. This knowledge-mapping tool can be used as an individual or group tool to summarize discussions in forum, chats and web videoconference; to develop brainstorming activities to explore new ideas, organize key concepts from text and structure arguments to write essays. Figure 1 shows an example of Compendium task.

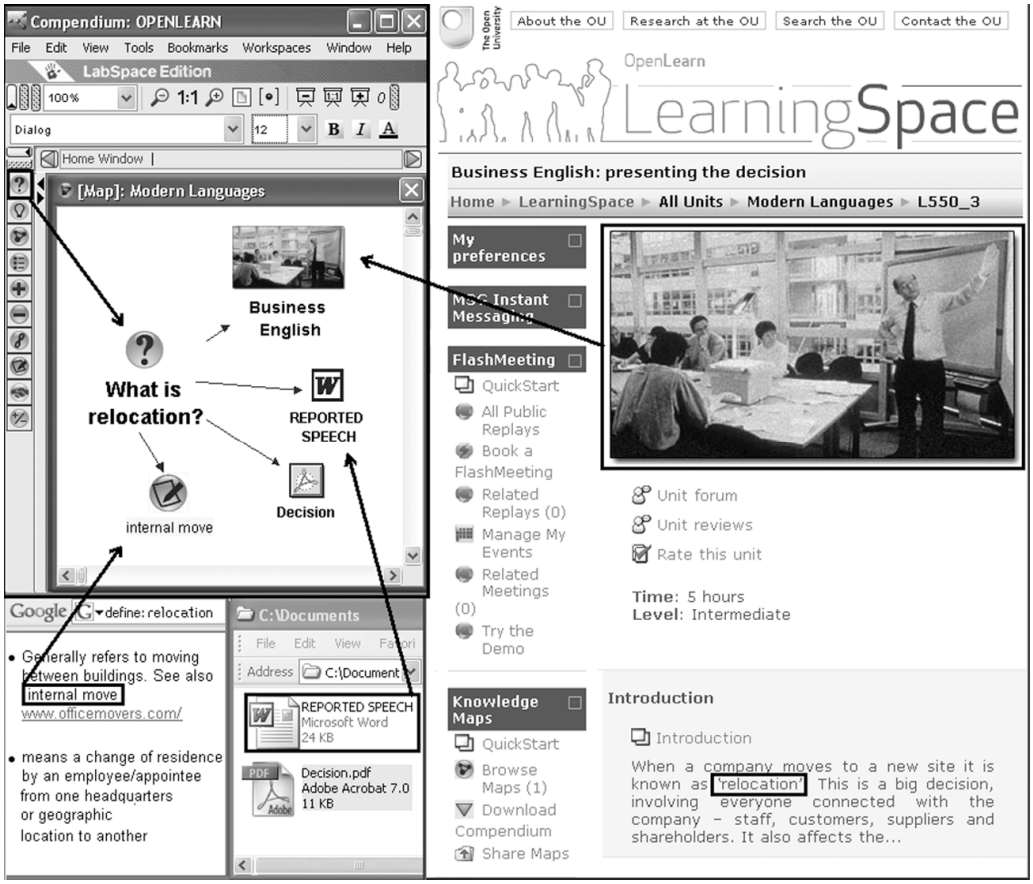


Fig1. Compendium – dragging and dropping information to facilitate reading and interpretation - through icons, comments and tags.

Compendium allows users to include any kind of files in the map, for example video, text, web pages, figures, tables, graphics and sound. Its key feature is its ability to categorize information through a set of different types of icons which represents questions, ideas, pros, cons, references, notes, decisions, lists and maps. The tool allows users to develop their own sets of icons and groups these using stencils.

Each icon in Compendium can be classified by keywords called "tags". When the map contains a lot of information, users can search by tags and type of icons, which facilitates the constructions of new maps based on specific themes. Knowledge Maps are a very useful strategy to select, connect and share meaningful information from open sources available on the web. It is a way of integrating different viewpoints, interpretations, and meanings facilitating the process of sense making. (Compendium, 2007, Bucking Shum, S. 2005, 2005a).

There are many free language materials not only in the OpenLearn project but also in other open content initiatives developed by academic institutions indicated in the table1 below:

| | |
|---|---|
| MIT OpenCourseWare (USA) | http://ocw.mit.edu/OcwWeb/ |
| Rice Connexions (USA) | http://cnx.rice.edu/ |
| ParisTech OCW (France) | http://graduateschool.paristech.org/ |
| CORE (China) | http://www.core.org.cn/en/index.htm |
| Japanese OCW Alliance (Japan) | http://www.jocw.jp/ |

Table1. Open Content initiatives. More examples can be accessed in http://www.hewlett.org/Programs/Education/OER/OpenContent/

In order to learn about specific topics, teachers can remix the most interesting learning resources by selecting, ordering and sharing OER from different sources through maps. Then learners can visualize a meaningful sequence of different possibilities and navigate easily through different resources saving a reasonable amount of time. They can also download these maps and gather more language learning materials from various sources by dragging and dropping them onto Compendium, sequence them into their own learning path, and publish their maps helping their peers with new combinations.

A learning path map is similar to "my favorite list" or "del.icio.us" web application. It can combine easily a sequence of the most exciting web pages about language learning. However, this graphical representation is a more attractive and meaningful diagram (map) than a simple sequence of URLs (list). Moreover, it has the advantage of offering more possibilities: multiple sequences, extra information, personal comments represented by symbols and classified by categories.

There are many mapping techniques used to create maps, such as mind mapping, concept mapping, web mapping and argument mapping. Theses mapping techniques can be very useful for teachers while designing learning activities and for students to planning their tasks and answering questions while developing reading and writing skills. The next section will discuss further information on some mapping techniques. The examples illustrating each technique are from the unit of the OpenLearn – *"L550-3 Business English – presenting the decision".* These maps can be accessed in the LearningSpace environment.

## 4 - Knowledge mapping techniques applied to language learning

### 4.1 - Mind Mapping

Mind Mapping was developed by Buzan around 1974 in the popular book "Use Your Head". Thoughts are often difficult to represent in a linear order and initially appear without logical structure. Mind Mapping allows ideas to be represented non-linearly, using keywords, sentences and pictures in graphic form. The elements are connected by lines and arrows, with short descriptions.

Mind Mapping is a useful technique by which to generate new ideas, like brainstorming. Through mind maps, students can generate a large number of keywords as an initial step for solving a problem. This technique is helpful in developing creativity and learners can organize their initial ideas related to a subject to develop a project, write an essay or prepare a presentation.

For example, figure 2 below shows a mind map constructed to answer the activity - *What questions could you elaborate about relocation during an interview*? Using Compendium students can map their initial ideas, bringing in as many keywords as possible. Then, for each keyword, they can elaborate a question.

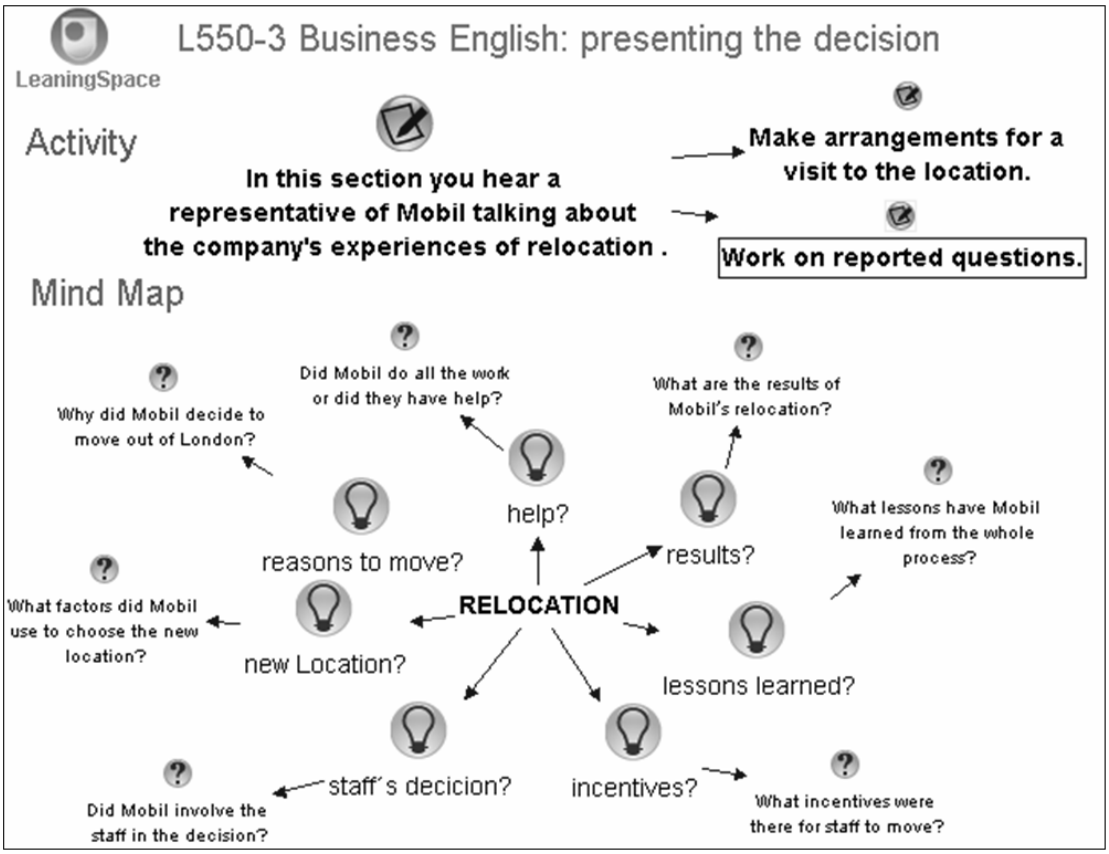


Fig2. Mind Map created with Compendium - Questions about "Relocation" – Business English (http://kmi.open.ac.uk/projects/osc/compendium/mmap/)

**4-2 Concept Mapping**

Concept Mapping was developed by Novak in the 1970's and based on Ausubel´s theory of meaningful learning. This constructivist approach emphasized that learning with understanding only takes place when new concepts are connected to what is already known. Concept maps externalize a learner's current knowledge structure, helping them to see connections with new information, and make sense of it.(Novak, 1990)

Concept Mapping is a mapping technique used to construct relationships between concepts. Learners can create concept maps to show important keywords from a webpage, explain their meaning, connect them to other definitions from the internet and to familiar keywords representing their existing knowledge.

For example, the concept map created through Compendium in figure 3 shows keywords used to describe "reported speech". It represents a network of key concepts and the relationships between them.

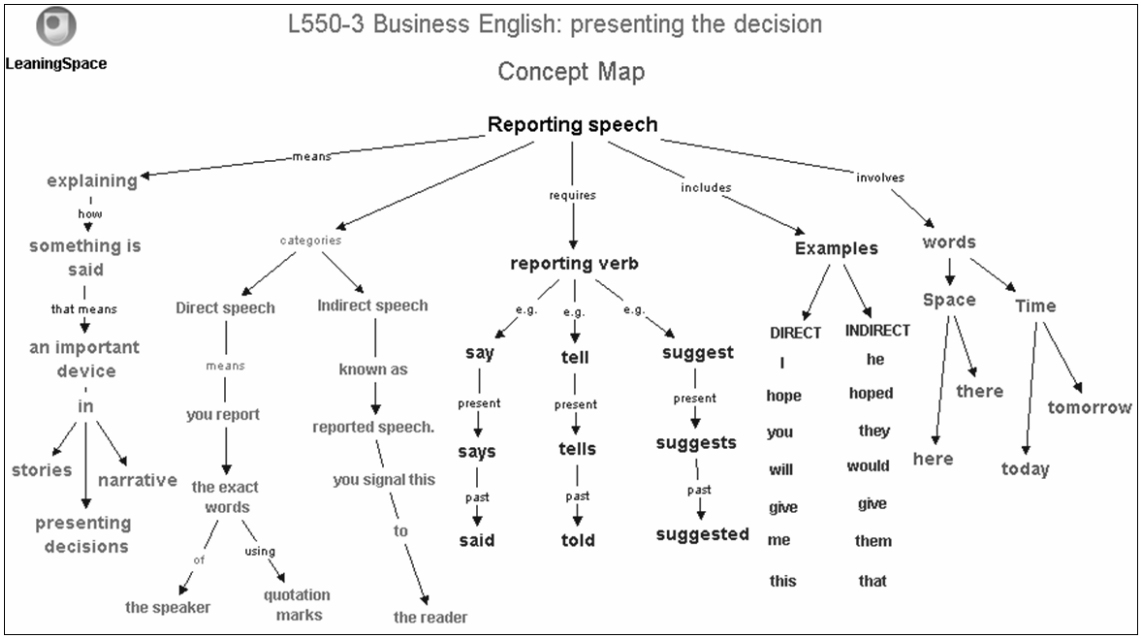


Fig3. Concept Map created with Compendium - Questions about "Relocation" – Business English (http://kmi.open.ac.uk/projects/osc/compendium/cmap/)

### 4.3 Dialogue Mapping

Dialogue mapping was developed by Conklin (2006) to solve wicked problems and share an understanding of these during discussion. It is also derived from the Issue-based Information System (IBIS) developed by Rittel in the 1970s to solve ill-structured problems. IBIS is a rhetorical grammar with three core elements: issues, positions and arguments all of which can be rendered as textual outlines and graphical maps that grow with the conversation.

Dialogue Mapping is a sensemaking strategy useful for structuring reasoning based on questions, statements, pros, cons and conclusions. Dialogue maps can be applied to prepare and present a set of arguments, develop a logical line of reasoning and facilitate critical thinking. Learners can create these maps with Compendium to organize argumentation in face to face meetings and online conversations such as discussion forum, web videoconference, chat, or from texts and video clips. Dialogue maps can contain any kind of resource such as video, pictures, audio, graphs, text, forum or webconference. Figure 4 is an example of a dialogue map.

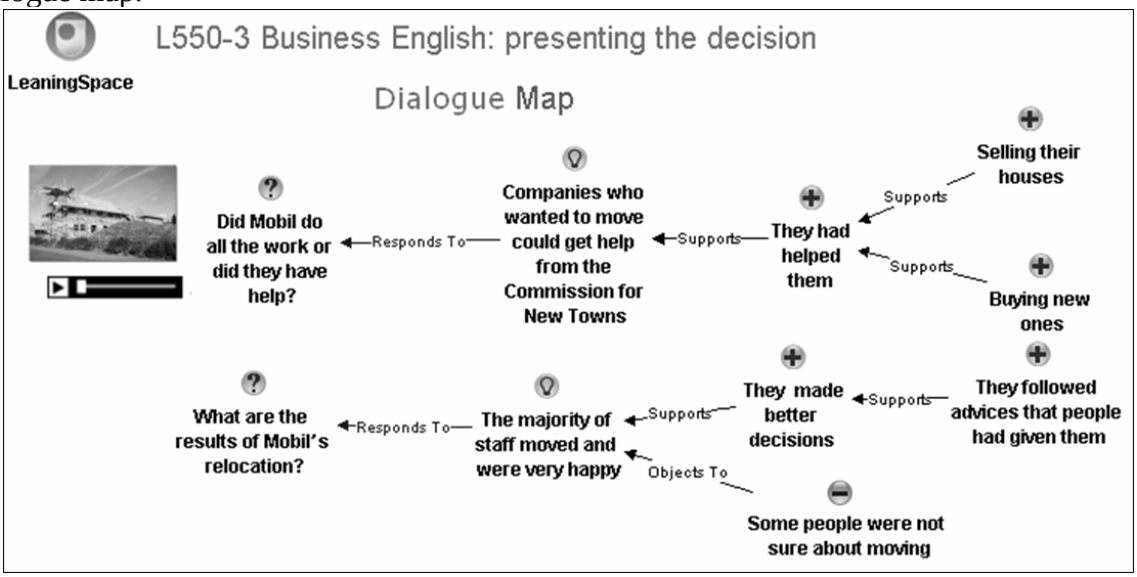


Fig4. Dialogue Map created with Compendium - interview about relocation

(http://kmi.open.ac.uk/projects/osc/compendium/dmap/)

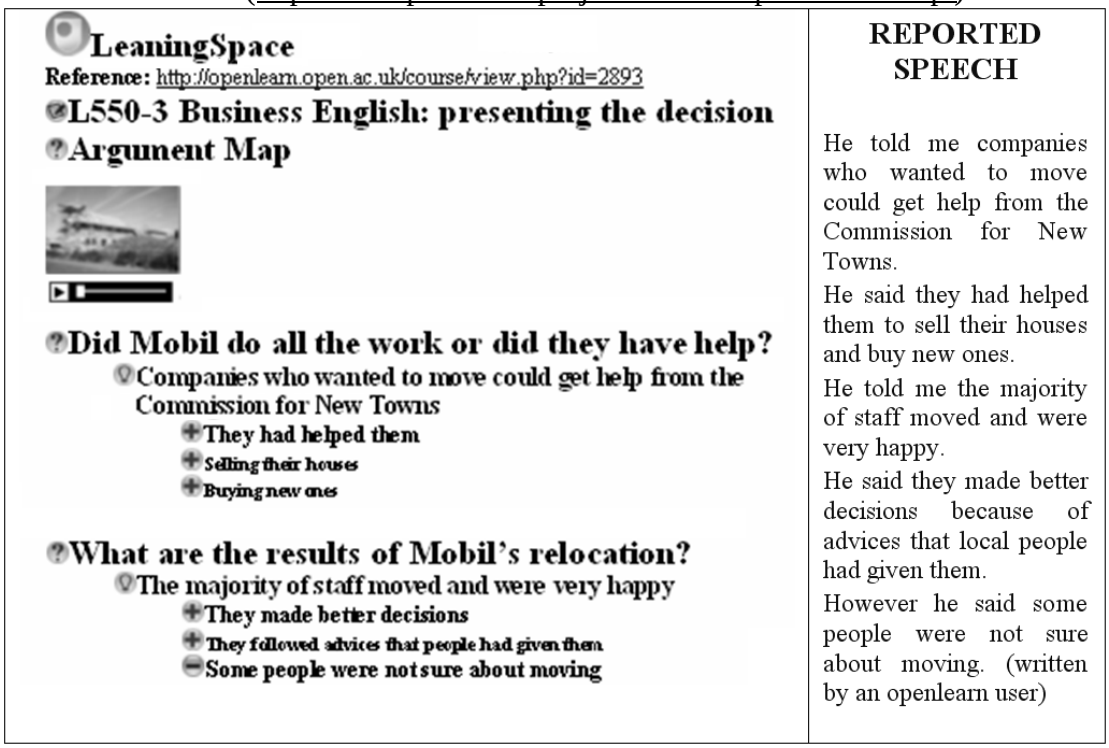


Fig5. Report Speech generated from a dialogue Map – Outline View in Compendium

In the examples above, figure 4 and figure 5 shows the process in which a dialogue map was created from an audio clip about "interviewing for relocation". This dialogue map was a useful strategy for taking notes and recording the main statements made during the conversation. After constructing the map, students can export using "outline view" which shows a linear sequence of arguments. They can then produce a text using reported speech.

**4.4 – Argument Mapping**

Argument Mapping was developed by J.H. Wigmore in 1913 to help in the analysis of legal arguments by showing the evidence for each claim, and how it is related in the structure of the argument. This mapping technique is also widely used in informal logic and in the teaching of philosophy and critical thinking (Harrell, 2005; van Gelder, 2001, 2004).

Therefore is another technique which can be used to develop critical and logic thinking. In an argument map, statements are organized in a coherent structure based on claims, reasons, and objections. In order to develop reasoning, several questions can be asked: What is the main preposition? What are the evidences? What are the reasons for and against? Through questioning, stronger arguments can be selected and better conclusion can be reached. Argument maps are also an efficient way to represent the key line of reasoning because they extract the logical and coherent essence of thinking, leaving out what is not relevant or what does not add value. Visualizing the process of thinking through argument helps students reflect on content and develop better structures. Figure 6 shows an example of an argument map about moving from small towns to big cities. As we can see, through this argument map created in Compendium, learners can draw their reasoning by structuring claims, objections and reasons.

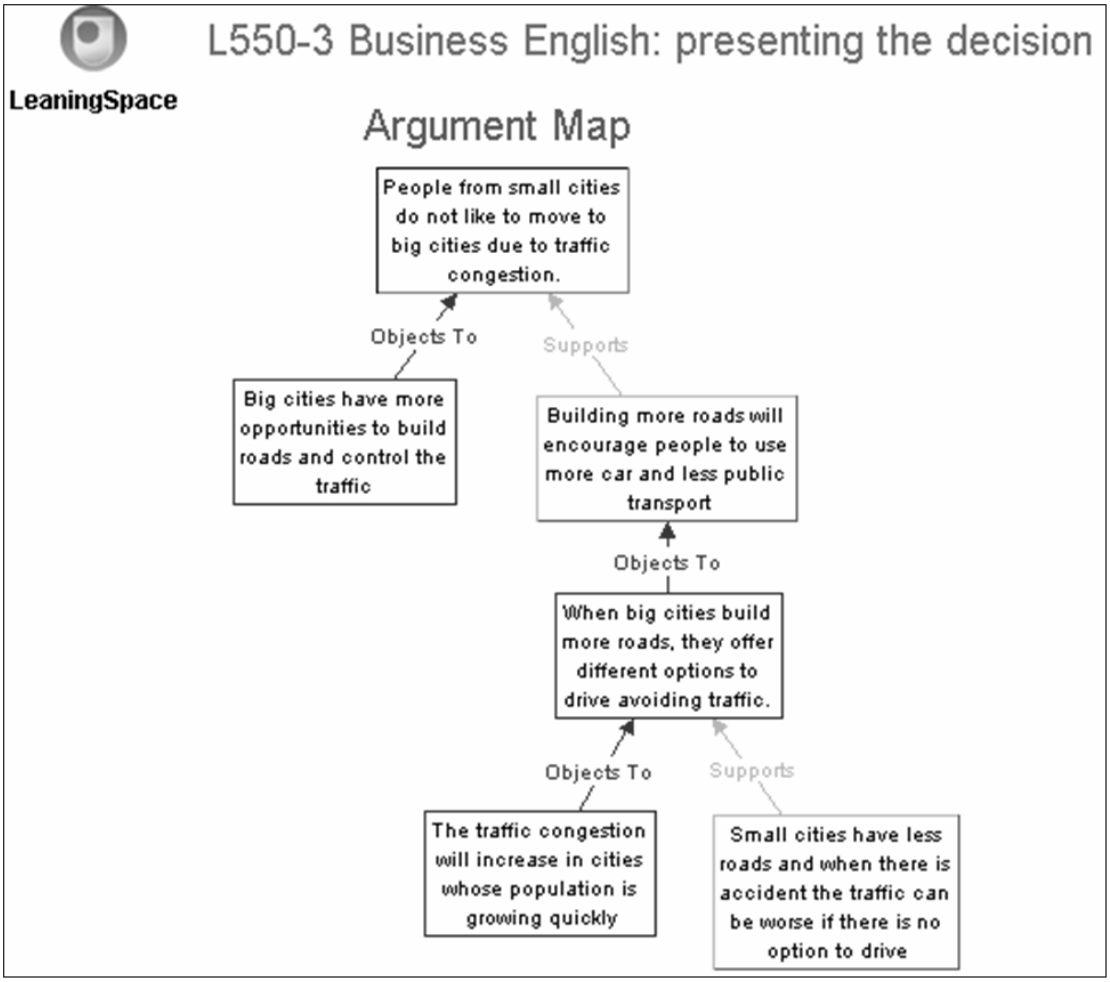


Fig 6. Argument Map created with Compendium – Outline View and Reported Speech on Relocation (http://kmi.open.ac.uk/projects/osc/compendium/amap/)

**4.4 - Web Mapping**

The technique known as Web Mapping developed in response to the rapid growth of the internet. The huge number of websites and overflow of information can cause users to become lost in cyberspace. Web maps enable users to record their navigation using icons, hypertext and hyperlinks. Cartography tools permit selection of what is relevant in cyberspace, indexing and retrieving hypermedia web material (Dodge and Kitchin, 2000). Web Mapping is a useful technique to group and share important references from learning materials and from the web.

This example of a Web Map below (figure 7), which was created in Compendium, shows interesting websites relating "Business English – presenting Decisions" grouped by categories such as activities, videos, webpages, vocabulary lists, pdf files and maps. Teachers and students can select not only material from the OpenLearn environment; but also, from other learning resources available on the web, such as concepts in Wikipedia, videos in YouTube and pictures in Flickr.

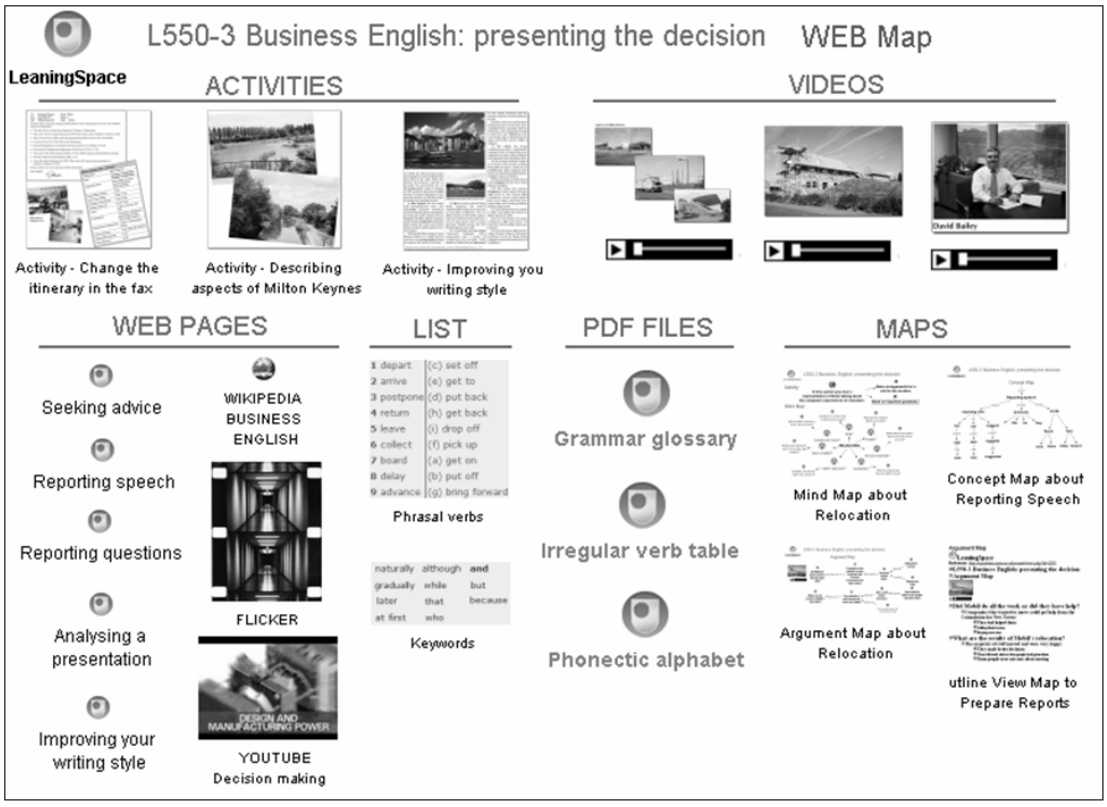


Fig7. Web Map created with Compendium – Interesting Resources about Business English – Decisions (http://kmi.open.ac.uk/projects/osc/compendium/wmap/)

## 5- FOSTERING OPEN LANGUAGE COMMUNITIES

Open educational resources and tools are not restricted to academic or scientific institutions, but comprise all learning communities. These include communities of practice, knowledge-creating communities, groups of peers and all individual learners interested in learning about similar topics. However, there are challenges facing open learning communities. These challenges, such as finding new peers and interact keep the community alive; and managing their own learning through assessment are discussed in the following subsections.

### 5.1 Finding new peers to interact and learn language together

In addition to Compendium, OpenLearn integrates two other knowledge media technologies, FlashMeeting and MSG. These tools can be used to find new peers, foster language learning communities and promote the collective building of knowledge.

Firstly, *MSG* is an instant messaging application with geolocation maps that allow students to find fellow learners. Like a 'personal radar' it shows who is online and where. With one click, language students can chat by sending instant messages. A key advantage of MSG compared to other instant messenging systems such as MSN Messenger, AIM andGTalk) is its full integration into the LearningSpace and LabSpace environments. Participants can see who is currently online and can immediately communicate synchronously. Participants can access a list of contacts automatically generated in MSG based on the courses they have enrolled on. (MSG, 2007)

Secondly, FlashMeeting is a web-based video-conferencing application. This new media system offers instant meeting – any time, any place and any platform. The applet is implemented in Adobe Flash, a widely available and highly compatible type of browser plug-in. It is incredibly lightweight, efficient, and pleasing to the eye. Based on Flash MX Server technology, through FlashMeeting it is possible organize, record, edit and share virtual

meetings. Meeting recordings can be annotated with comments and tags. Every part of the meeting is a URL so any event, comment, text chat or speaker in the meeting can be directly referred to (FlashMeeting, 2007). Figure 8 shows the FlashMeeting screen where participants were discussing about the openlearn project. A language learner or a teacher can book a meeting and the system generates a URL. This URL can then be shared to the language learning community by email or via MSG.

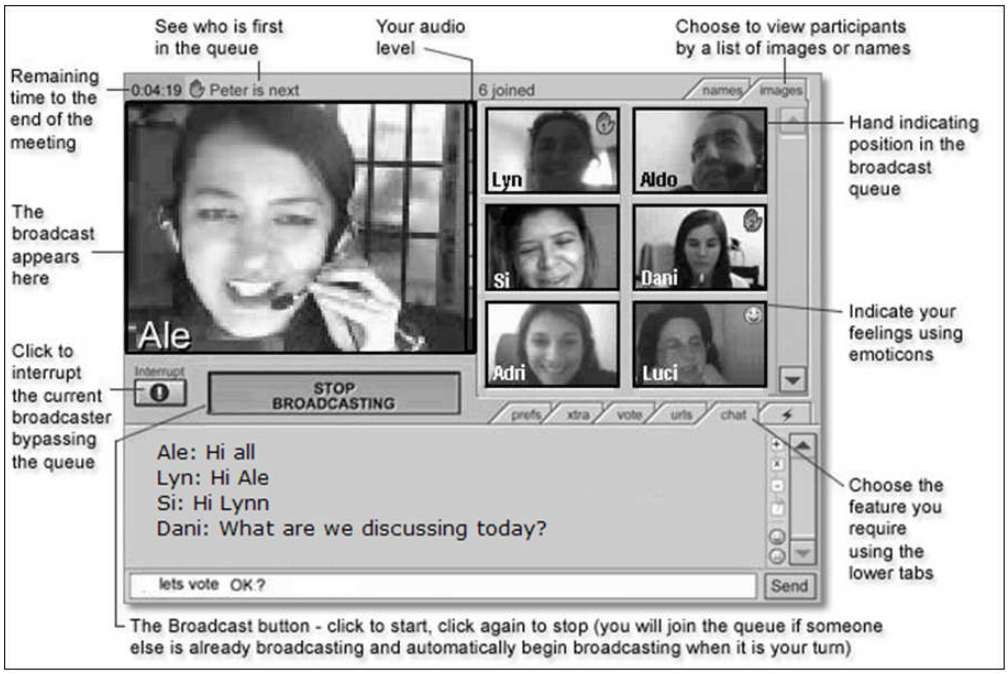


Fig8. FlashMeeting is a web video-conferencing application offering instant online meetings.

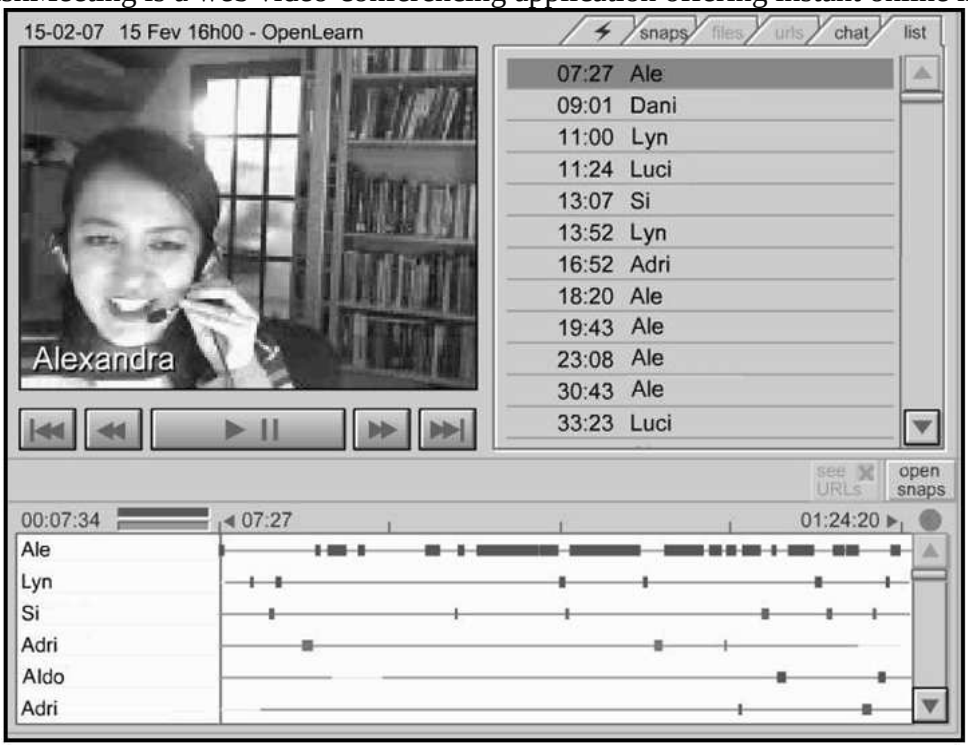


Fig9. FlashMeeting Memo applet showing a peer-to-peer event(left), chat(right) and timeline(botton). ( http://flashmeeting.open.ac.uk/)

The replay is browsed by navigating through the names of the attendees or via the timeline which represents the length of each broadcast. There are different kinds of FlashMeeting

events such as seminars held by experts, video lectures on a variety of topics, web-casts talks, interviews of e-learning specialists, moderated project meetings, peer-to-peer student meetings and many other examples.

### 5.2 Resources for Open Learning Assessment

Through FlashMeeting, participants can exchange interesting URLs, questions, possible answers, arguments, and some possible conclusions. FlashMeeting allows participants to create labels to mark specific segments in the meeting and they can also type keywords in the FlashMeeting chat log. After the event, the FlashMeeting Memos generate a set of metadata, available in XML file which can be imported into Compendium and turned automatically into knowledge maps.

Through these maps, participants can visualize a summary of key information exchanged in the meeting including temporal and conceptual references:

- Figure10 shows several Compendium maps related to a FlashMeeting about the OpenLearn project. These maps introduce an overview of the webconference: attendees, who spoke when, chat, URLS visited, whiteboard, voting, keywords and meeting files chat.
- The map in the figure11 allows the user keep track of who spoke when.
- The map in the figure12 includes all URLs shared and visited during the event. Users can click and navigate on the websites suggested by attendees in the meeting.
- The map in the figure13 presents questions, ideas, pros and cons discussed on the webconference.

All the elements in the knowledge maps illustrated by figure 10 – 13 created in Compendium are automatically linked to the webvideoconference. Therefore, participants can use them to replay only interesting segments. Through the maps, they can evaluate the content of the meeting and also their learning during the event. They can edit maps and organise new connections in a strategy to reorganize their learning and reconstruct their knowledge.

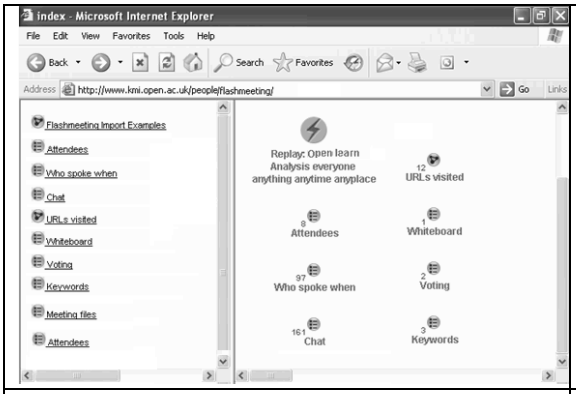


Fig10. A FlashMeeting maps in Compendium


Fig11. Keeping track of who spoke when

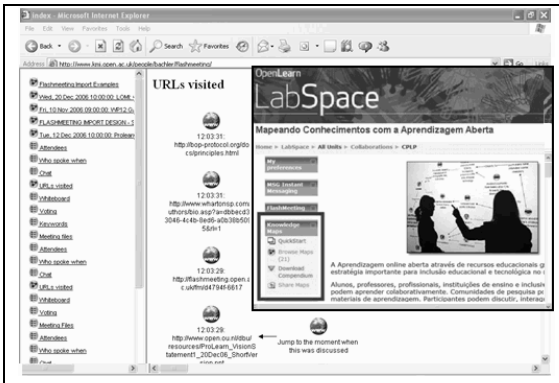


Fig12. Mapping the URLs visited along with their time during the event

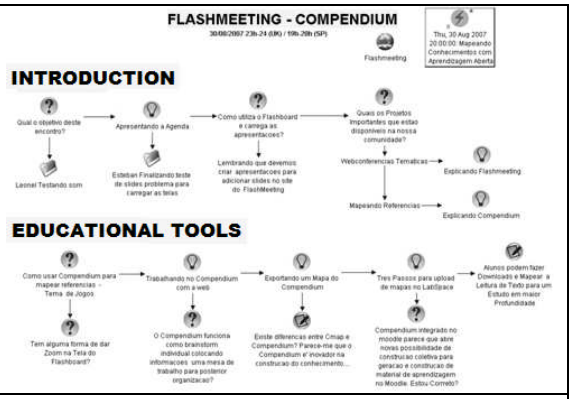


Fig13. Mapping questions, ideas, pros and cons discussed on the webconference

**Using Graphs to evaluate participation in language learning meetings**

Another way of evaluating participation language learning meeting is through "linear and polar visualizations" of the broadcast and chat dominance per attendee automatically generated by FlashMeeting. Through these graphs, students and teachers can visualize how knowledge is transferred via a range of communication channels, such as audio, video and text chat (Scott, Tomadaki and Quick 2007).

Students can use these communication channels provided in FlashMeeting differently which also includes whiteboard, urls, lists and a voting system. Through these graphs, it is possible to identify participation according to:

- each user's percentage of the total event audio-visual talk time.
- proportion of the number of chat messages that the user made compared to the number of messages of the most active participant.(Scott et al, 2007).

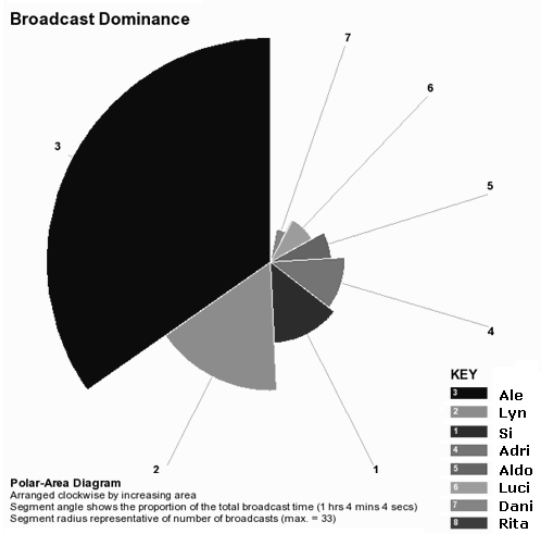


Fig14. The broadcast dominance

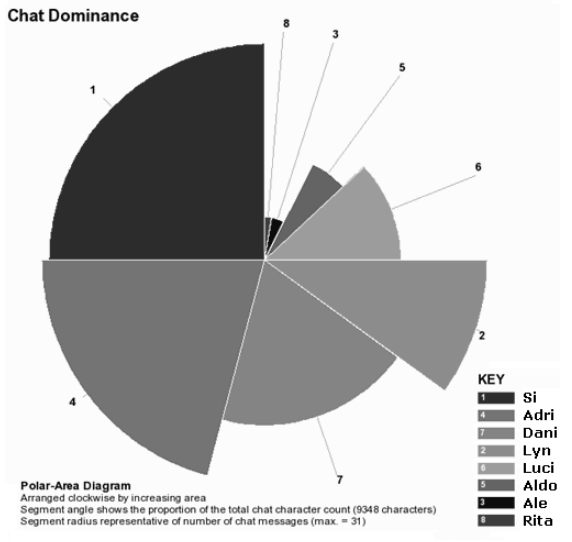


Fig15. The chat dominance

Some events in FlashMeeting present graphs with similar features. For instance, in virtual seminars and lectures, the main presenter takes up nearly all of the broadcast time, and the graphs will show the dominance of one person. Interviews will show the presence of the interviewee and the interviewer. A collaborative student meeting will show similar participation among participants, which can be a good indicator for quantitative analyses. The knowledge map can show the content of contributions, which can be tagged to indicate the

quality of participation. Therefore, through graphs and knowledge maps, the OpenLearn community can identify if the meeting was productive, if time was well shared between all participants and if the quality of content was meaningful. Sometimes, some participants may talk less than others, but their contribution in terms of ideas, references and questions, can be of have more quality that of colleagues who are more talkative. Additionaly, graphs and maps can offer data for both quantitative and qualitative analysis.

**Mapping Social Presence using MSG and FlashMeeting**

Social Presence is an indispensable feature for language learning communities. In Biocca et al (Okada, Tomadaki, Little and Bachler, 2001), social presence is described as 'being there in other places' and 'being there with other people'. Mapping social presence can be a strategy in visualizing collective intelligence, diversity of participants from different countries, the most popular events, the biggest communities, etc. Students and teachers can identify who and where specialists are, the most interactive communities and the most popular events. By providing geo-locations of the individuals who may be relevant to a specific knowledge domain, students can easily contact people available online or face-to-face. An instant messaging system, MSG offers a set of presence attributes such as time, context, availability, location and activity etc. All these indicators can help students meet other fellow learners with similar interests or is interesting and interactive language learning communities. They can than access a list of contacts which may provide peer support during learning activities. Figure 19 illustrates the availability of contacts throughout the globe, mapping who is online and available to be contacted.

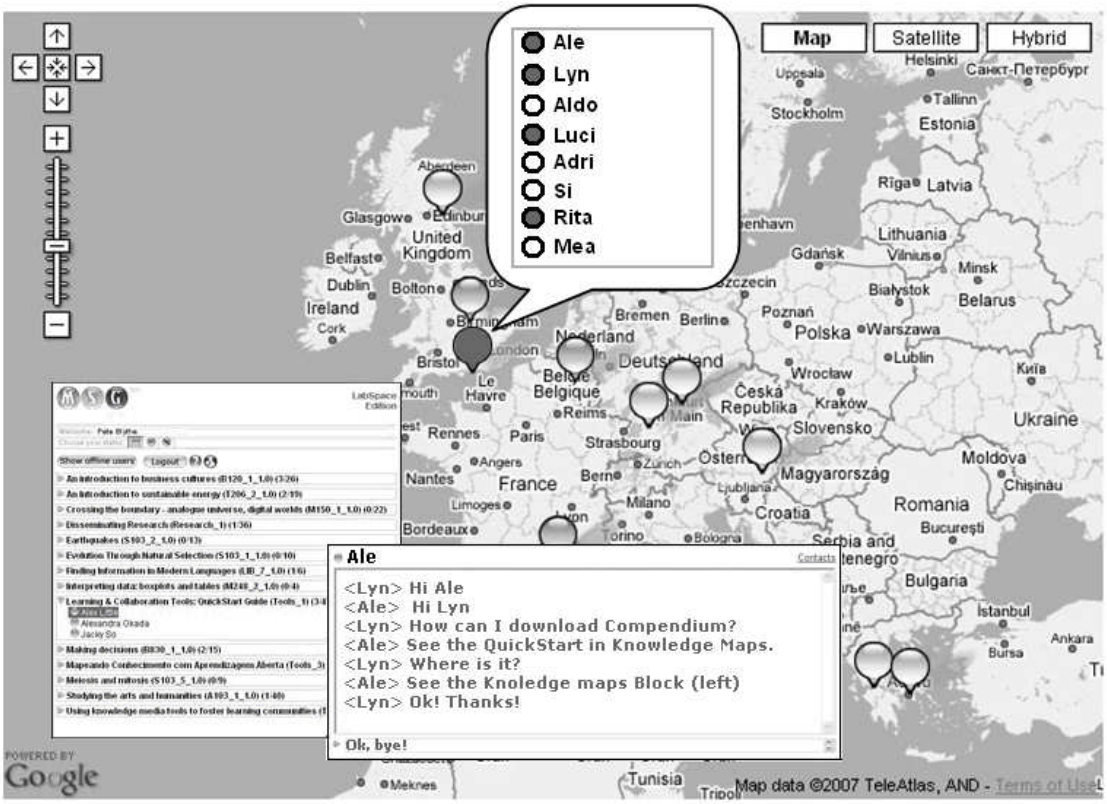


Fig16. MSG, displaying the availability on contacts of the same course worldwide. (kmi.open.ac.uk/technologies/msg/about/)

FlashMeeting also shows geographic maps on the location of participants. Through these geographic maps, which are generated automatically, participants in the community and

possible new members can see the distribution of users for both the attendance of live FlashMeeetings and FlashMeeting replay access.
These maps are useful in illustrating:

1. how the tool is being used to connect people from the same social network or community of practice
2. the learning impact of the event reuse in different parts of the world.

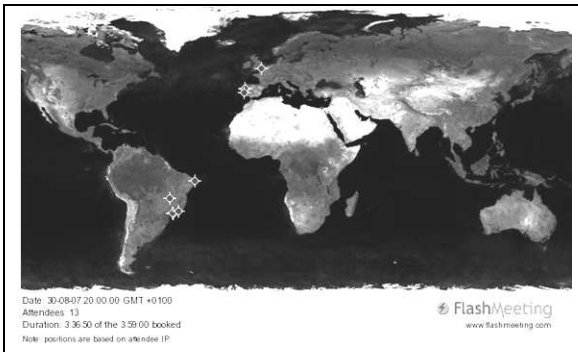


Fig17. 13 Live FlashMeeting attendees of the OpenLearn webconference in March 2006.

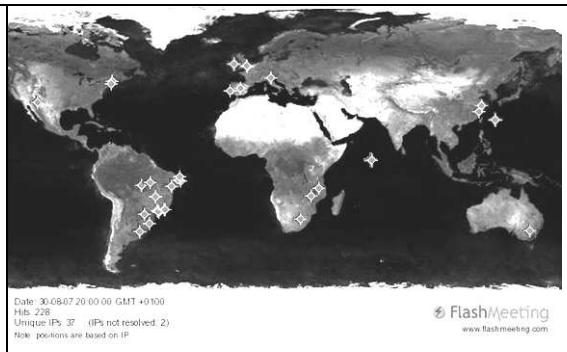


Fig18. 228 unique IPs of the viewers - OpenLearn webconference replay until October 2007.

The geographic maps above, Figure 17 and 18 related to a FlashMeeting event, the live 'OpenLearn webconference' (Flashmeeting - Compendium) on 'Open Content and Metadata', which was held in March 2006 and attended by 14 participants located in different parts of Europe and South America. The public replay was viewed 1024 times by 548 different users in Europe, Australia, Asia, Africa, as well as South and North America until March 2007. (Scott, Tomadaki and Quick, 2007).

## 6. CONCLUSION AND FUTURE RESEARCH

In conclusion, a heightened understanding of influential factors that shape the effectiveness of peer interactions is essential to fostering open learning communities. Knowledge Media tools such as Compendium, Flashmeeting and MSG have indicated new possibilities for language acquisition. New strategies such as knowledge mapping, interactive discussions through web videoconferencing and finding new peers through geolocation instant messaging have been seen to be very useful in the development of language-learning skills. Open learning communities are a valuable opportunity for students to:

Manage their own process of learning by:

- Learning to learn
- Time Management
- Self Motivating
- Developing Critical thinking
- Mapping information and knowledge
- Organising their own learning path
- Exploring new learning styles

And to learn with others by

- Collaborative/cooperative learning

- Studying in groups
- Solving conflict and difficulties together
- Peer mediation
- Active Listening
- Sensemaking
- Broadening their network of social relationships
- Situated language learning in real context
- Collective feedback and self assessment

In our future research, our aim is to investigate how participants of language learning communities in the OpenLearn project can develop their abilities to learn language easily and collaboratively through these tools and collaborate with the open content initiative. OpenLearn is potentially an effective learning environment for language acquisition.
The concept of openness marks a profound shift in theories and methods of language learning, involving developing skills, constructing and sharing knowledge collaboratively, and participating as active learners. Students move from simply following information / instructions / rules to discussing and making sense of these, as well as reconstructing and sharing meanings collectively.

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